FILE 'CAPLUS' ENTERED AT 18:47:55 ON 23 SEP 2003
L5 3434 (CRYOGENIC OR SUPERFLUID OR SUPERCRITICAL) (S) (ABSORPTION OR SPECTRO?)
L6 0 L5 AND IMPURIT
L7 88 L5 AND IMPURIT?

L7 ANSWER 1 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Rapid method development for chiral separation in drug discovery using sample pooling and supercritical fluid chromatography-mass spectrometry
L7 ANSWER 2 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Microscopic superfluidity of small 4He and para-H2 clusters inside helium droplets
L7 ANSWER 3 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Advancing NMR Sensitivity for LC-NMR-MS Using a Cryoflow Probe: Application to the Analysis of Acetaminophen Metabolites in Urine
L7 ANSWER 4 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Supercritical fluid extraction for the detection of 2-dodecylcyclobutanone in low dose irradiated plant foods
L7 ANSWER 5 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Testing of superfluid-cooled 920 MHz NMR cryostat
L7 ANSWER 6 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Detector signal relaxations and their correction: the Si:Ga bulk detectors of the CRISTA instrument
L7 ANSWER 7 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Application of density-functional theory to line broadening: Cs atoms in liquid helium
L7 ANSWER 8 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Synthesis and thermal decomposition of nitrate-free boehmite nanocrystals by supercritical hydrothermal conditions
L7 ANSWER 9 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Single and double infrared transitions in rapid-vapor-deposited parahydrogen solids: application to sample thickness determination and quantitative infrared absorption spectroscopy
L7 ANSWER 10 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Structural studies of impurity-helium solids
L7 ANSWER 11 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Application of density functional theory to line broadening: Cs atoms in liquid helium
L7 ANSWER 12 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Local spectroscopy of a Kondo impurity: Co on Au(111)
L7 ANSWER 13 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI CO/pH2: a molecular thermometer
L7 ANSWER 14 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Natural products characterization: Analysis of mass-limited samples using 3-mm microCryoProbe

L7 ANSWER 15 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Progress of fusion fuel processing system development at the Japan Atomic Energy Research Institute
L7 ANSWER 16 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Method and system for detecting trace materials in cryogenic liquids
L7 ANSWER 17 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Dimerization of 3He in 3He-4He dilute mixtures filling narrow channels
L7 ANSWER 18 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Injection level lifetime spectroscopy of impurities in semiconductors
L7 ANSWER 19 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Solvation structure of impurity molecules in supercritical fluids studied by photoconductivity measurement and X-ray absorption fine structure (XAFS) spectroscopy
L7 ANSWER 20 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Sample purification for spectroscopic high-pressure investigations by dynamic supercritical fluid extraction
L7 ANSWER 21 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Potential interferences generated during mercury species determination using acid leaching, aqueous ethylation, cryogenic gas chromatography and atomic spectrometry detection techniques
L7 ANSWER 22 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Pairing in Fermi fluids in restricted geometries
L7 ANSWER 23 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Optical spectra of atoms in liquid helium and cold helium gas
L7 ANSWER 24 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Ortho/para hydrogen converter for rapid deposition matrix isolation spectroscopy
L7 ANSWER 25 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Illuminating single molecules in condensed matter
L7 ANSWER 26 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Pairing in Fermi fluids in restricted geometries
L7 ANSWER 27 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Hydrogen exchange reactions in supercritical media monitored by in situ NMR
L7 ANSWER 28 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Tunneling into magnetic atoms: Local spectroscopy of Kondo impurities.
L7 ANSWER 29 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Ions and atoms in superfluid 4helium: motion studies and optical transitions
L7 ANSWER 30 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI ESR spectroscopy of N(4S) atoms trapped in superfluid helium
L7 ANSWER 31 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Spectroscopic study of atoms and molecules in liquid helium
L7 ANSWER 32 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI High-pressure investigations on the solubility of synthetic and natural dyestuffs in supercritical gases by VIS-spectroscopy up to 180 MPa
L7 ANSWER 33 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Nuclear spin polarization in heavy-ion reactions
L7 ANSWER 34 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Optical spectroscopy of atoms in superfluid helium

L7 ANSWER 35 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Laser spectroscopy of impurity atoms in superfluid helium

L7 ANSWER 36 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Poly(vinyl chloride) and vinyl chloride copolymer powders suitable for use in PVC pastes, removal of auxiliary compounds from the powders, and use of the powders

L7 ANSWER 37 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Interaction between charge carriers and foreign atoms in superfluid helium. From bound states to unusual transport

L7 ANSWER 38 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI SFC/NMR online coupling

L7 ANSWER 39 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI A new process for the production of high purity carbon monoxide and hydrogen

L7 ANSWER 40 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Investigation of impurities in superfluid helium by optical spectroscopy

L7 ANSWER 41 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Preparation, structural properties, and hydrogenation activity of highly porous palladium-titania aerogels

L7 ANSWER 42 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI High surface area platinum-titania aerogels: preparation, structural properties, and hydrogenation activity

L7 ANSWER 43 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Determination of trace amounts of impurities in molybdenum by spark source and glow discharge mass spectrometry

L7 ANSWER 44 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI IR spectroscopy and analysis of the impurity composition of individual xenon fluorides in liquid noble gas solutions

L7 ANSWER 45 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Semi-self-maintained glow discharge in a mixture carbon monoxide and nitrogen at cryogenic temperatures

L7 ANSWER 46 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Consideration of the chemical reactivity of trace impurities present in a glow discharge

L7 ANSWER 47 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Spectroscopy of alkali atoms and molecules in superfluid helium

L7 ANSWER 48 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Vibrational spectra of phosphine of various degrees of purity in a solution of liquid argon

L7 ANSWER 49 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Cryogenic coil for glow discharge sources

L7 ANSWER 50 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Solar magnetic field studies using the 12 micron emission lines. II. Stokes profiles and vector field samples in sunspots

L7 ANSWER 51 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Monitoring of dopant and impurity concentrations in liquid argon by infrared spectroscopy

L7 ANSWER 52 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Dye laser spectroscopy of isolated atoms and ions in liquid helium
L7 ANSWER 53 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Isotopic spectral analysis of inorganic gases
L7 ANSWER 54 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Application of a cryospectroscopy method to study the molecular composition of gases
L7 ANSWER 55 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Steam reforming of hydrocarbons for producing hydrogen and carbon monoxide
L7 ANSWER 56 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Very low temperature cathodeluminescence analyzer
L7 ANSWER 57 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Method and apparatus for the purification of nitrogen in cryogenic air separation
L7 ANSWER 58 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI in situ Moessbauer spectroscopy of a species irreversibly adsorbed on an electrode surface
L7 ANSWER 59 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Krypton removal from the dissolver offgas with the solvent R-12
L7 ANSWER 60 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Reconditioning of semiconductor detectors
L7 ANSWER 61 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Isotopic-chromatographic-spectral analysis of high-purity inorganic gases
L7 ANSWER 62 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Vibrational spectra of liquid high-purity silicon, germanium, sulfur, and selenium hydrides and their solutions in liquid krypton
L7 ANSWER 63 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Absorption spectra of silicon irradiated with reactor neutrons at cryogenic temperatures
L7 ANSWER 64 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Solar magnetic field studies using the 12 micron emission lines. I. Quiet Sun time series and sunspot slices
L7 ANSWER 65 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Process and apparatus to produce ultra-high-purity oxygen from a gaseous feed
L7 ANSWER 66 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI The kinetics of phonon-impurity system of superfluid helium-3-helium-4 solutions
L7 ANSWER 67 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Helium-filled proportional counter for low-temperature operation (4.2-300 K) and its application to cryogenic resonance-electron Moessbauer spectroscopy
L7 ANSWER 68 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Transport efficiency of free atoms for laser spectroscopy using a cryogenic helium jet
L7 ANSWER 69 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Application of low temperature desorption in systems for adsorptive purification of cryogenic gases
L7 ANSWER 70 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Phonon and impurity absorption of sound in dilute helium-3/helium-4 solutions below 0.5 K

L7 ANSWER 71 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Adsorption methods for the purification of air and the products of air fractionation
L7 ANSWER 72 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Composition of residual gases in laboratory metallurgical apparatus with cryogenic pumping
L7 ANSWER 73 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Spectroscopic studies of pyrazine in cryogenic solutions
L7 ANSWER 74 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Spectroscopic studies of pyrazine in cryogenic solutions
L7 ANSWER 75 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Cryogenic techniques in infrared spectroscopy
L7 ANSWER 76 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI Feasibility studies on exhaust plasma processes
L7 ANSWER 77 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
TI FFTF sodium and cover-gas chemistry

=> d l7 ibib abs 10, 13, 16-21, 25, 28, 30-35, 37-40, 43-49, 51-54, 62, 66-71, 73-75

L7 ANSWER 10 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2001:928857 CAPLUS
DOCUMENT NUMBER: 136:268555
TITLE: Structural studies of impurity-helium solids
AUTHOR(S): Kiselev, S. I.; Khmelenko, V. V.; Lee, D. M.;Kiryukhin, V.; Boltnev, R. E.; Gordon, E. B.; Keimer, B.
CORPORATE SOURCE: Laboratory of Atomic and Solid State Physics, Cornell University, Ithaca, NY, 14853-2501, USA
SOURCE: Physical Review B: Condensed Matter and Materials Physics (2002), 65(2), 024517/1-024517/12
CODEN: PRBMDO; ISSN: 0163-1829
PUBLISHER: American Physical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB We have used x-ray diffraction and ultrasound techniques to study the structure of mesoporous impurity-He solids created after the injection of impurity particles (D2, Ne, N2, Kr) into a vol. of superfluid 4He. Clusters of impurities with size of order 50 .+-. 20 .ANG. and d. .apprx.1020 impurities/cm3 were obsd. by x-ray diffraction. The presence of a wide distribution of pore sizes in Im-He solids was revealed by ultrasound (80 to 8600 .ANG.) and by small-angle x-ray scattering (80 to >400 .ANG.). Both x-ray and ultrasound methods detected irreversible structural changes when samples were warmed above T.lambda. = 2.17 K. This is ascribed to the aggregation of small clusters caused by thermally activated diffusion. In addn. to being of fundamental interest, the properties of the unique porous media studied in this work may be relevant to investigations of low temp. chem. reactions, storage of free radicals, matrix isolation spectroscopy , and superfluid 4He contained in the pores of an extremely compliant medium.
REFERENCE COUNT: 38

L7 ANSWER 13 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2001:317187 CAPLUS
DOCUMENT NUMBER: 134:316805
TITLE: CO/pH2: a molecular thermometer
AUTHOR(S): Tam, Simon; Fajardo, Mario E.
CORPORATE SOURCE: US Air Force Research Laboratory, AFRL/PRSP, Propulsion Directorate, Edwards AFB, CA, 93524-7680, USA
SOURCE: Journal of Low Temperature Physics (2001), 122(3/4), 345-357
CODEN: JLTPAC; ISSN: 0022-2291
PUBLISHER: Kluwer Academic/Plenum Publishers
DOCUMENT TYPE: Journal
LANGUAGE: English
AB We utilize reversible temp. dependent changes in the IR absorption spectrum of CO mols. isolated in solid para-hydrogen (pH2) to probe bulk temp. changes during rapid vapor deposition. The intensity of a well resolved feature near 2135 cm-1 increases monotonically with temp. over the 2 to 5 K range. The thermally populated initial state of this transition lies .apprxeq.12 K above the CO/pH2 ground state. During the deposition of .apprx.100 ppm CO/pH2 samples, we detect temp. gradients .apprx.10 K/cm in .apprx.0.1 cm-thick samples subjected to heat loads .apprx.10 mW/cm2. The resulting estd. thermal cond. (TC) is 3(.+-.2) mW/cm-K, averaged over the 2 to 5 K region. This value is .apprx.1000 times lower than the TC of single crystal solid pH2, and .apprx.10 times lower than previously measured for pH2 solids doped with 100 ppm concns. of heavy impurities. We attribute this abnormally low TC to the known mixed fcc/hcp structure of the rapid vapor deposited solids.
REFERENCE COUNT: 44

L7 ANSWER 16 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2000:790718 CAPLUS
DOCUMENT NUMBER: 133:328939
TITLE: Method and system for detecting trace materials in cryogenic liquids
INVENTOR(S): Walker, Dwight Sherod; Mascho, John Anderson Jr.
PATENT ASSIGNEE(S): Glaxo Group Limited, UK
SOURCE: PCT Int. Appl., 26 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000067000	A1	20001109	WO 2000-US11418	20000428
EP 1177425	A1	20020206	EP 2000-926451	20000428
JP 2002543419	T2	20021217	JP 2000-615589	20000428

PRIORITY APPLN. INFO.: US 1999-132042P A2 19990430
WO 2000-US11418 W 20000428
AB A method for qual. and quant. detn. of trace impurities in a cryogenic liq., comprising the steps of (i) measuring the absorption spectrum of the cryogenic liq. by

passing light in the IR region through the cryogenic liq., the cryogenic liq. absorption spectrum having a 1st ref. energy, (ii) measuring the absorption spectrum of at least one impurity alone by passing light in the IR region through the impurity, (iii) passing a cryogenic liq. sample into a flow cell, wherein the max. pressure drop of the cryogenic liq. sample across said flow cell is at 0.5-5.0 lb./in.2, (iv) measuring the absorption spectra of the cryogenic liq. sample by passing light in the IR region through the cryogenic liq. sample while the cryogenic liq. sample is within the cell, (v) comparing the cryogenic liq. sample absorption spectra to the cryogenic liq. and impurity spectra, (vi) confirming the presence of the sample absorption spectrum assocd. with the impurity, the sample absorption spectrum assocd. with the impurity having a 2nd ref. energy, and (vii) detg. the concn. (C) of the impurity in the cryogenic liq. sample by the following relation, kC = log 2nd ref. energy/first ref. energy where k is a fixed proportionality const.
REFERENCE COUNT: 4

L7 ANSWER 17 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2000:629698 CAPLUS
DOCUMENT NUMBER: 133:256993
TITLE: Dimerization of 3He in 3He-4He dilute mixtures filling narrow channels
AUTHOR(S): Bashkin, Eugene P.; Wojdylo, John
CORPORATE SOURCE: Department of Physics, The University of Western Australia, Kenwick, 6107, Australia
SOURCE: Physical Review B: Condensed Matter and Materials Physics (2000), 62(10), 6614-6628
CODEN: PRBMDO; ISSN: 0163-1829
PUBLISHER: American Physical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB We consider dimerization of 3He in a dil. soln. of 3He in superfluid 4He filling straight narrow channels that can be found in nanoscale porous media. Dimer formation is facilitated by the restricted geometry and occurs despite the fact that in bulk fluid the interparticle interaction is too weak to lead to a bound state. Dimerization results in the effective "bosonization" of the system: a Bose quantum fluid of (3He)2 arises in place of the 3He Fermi component. At high temps., when the 3He impurity quasiparticles form a Maxwell-Boltzmann gas, a drastic change in the thermodn. occurs due to the presence of dimers. The sp. heat and magnetic susceptibility of the 3He component, which we calc. at arbitrary degrees of dimerization, show a marked deviation from behavior expected of an un-dimerized 3He component. We show that the binding energy - which depends on the channel width - is expected to be sufficiently high to make exptl. observation feasible. The presence of (3He)2 dimers gives rise to an extra absorption mechanism for first sound propagating through the superfluid 4He, due to resonant absorption and decay of dimers in the acoustic field. We have calcd. the absorption coeff. Several expts. suggest themselves, utilizing, perhaps, K-L zeolites or carbon nanotubes. If the dimers themselves turn out to be attractive, then quadrumers may appear: it may even be the case that a single 3He polymer will form over the entire length of the channel.
REFERENCE COUNT: 50

L7 ANSWER 18 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2000:275791 CAPLUS
DOCUMENT NUMBER: 132:301496
TITLE: Injection level lifetime spectroscopy of impurities in semiconductors
AUTHOR(S): Ahrenkiel, R. K.; Keyes, B. M.; Johnston, S.
CORPORATE SOURCE: National Renewable Energy Laboratory, Golden, CO, 80401, USA
SOURCE: Surface Engineering (2000), 16(1), 54-60
CODEN: SUENET; ISSN: 0267-0844
PUBLISHER: IOM Communications Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The identification of semiconductor defects is a major task in photovoltaic and most solid state electronic technologies. A variety of techniques are used in materials anal. and many were extensively described in the literature. Esp. desirable are non-contact techniques that are sensitive to impurities in metals. Photoluminescence spectroscopy comes close to meeting this need, however it usually requires cryogenic cooling of the test specimen. The present authors have found that techniques based on measurement of recombination lifetime over a wide range of injection levels can be powerful and sensitive for materials characterization. Not only is recombination lifetime sensitive to chem. and structural defects, but when a single defect dominates the recombination process that defect can be identified by observing the details of excess carrier decay over several orders of magnitude. This method of defect characterization and identification will be the focus of this paper.
REFERENCE COUNT: 28

L7 ANSWER 19 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2000:90838 CAPLUS
DOCUMENT NUMBER: 132:199340
TITLE: "Solvation structure of impurity molecules in supercritical fluids studied by photoconductivity measurement and X-ray absorption fine structure (XAFS) spectroscopy"
AUTHOR(S): *Nakagawa, Kazumichi; Murata, Takatoshi*
CORPORATE SOURCE: Faculty of Human Development, Kobe University, Kobe, 657-8501, Japan
SOURCE: **Proceedings of the IEEE International Conference on Dielectric Liquids, (ICDL '99), 13th, Nara, Japan, July 20-25, 1999 (1999), 108-109. Institute of Electrical and Electronics Engineers: New York, N. Y.**
CODEN: 68QJAZ
DOCUMENT TYPE: Conference
LANGUAGE: English
AB Solvation structure of anthracene mol. and bromonaphthalene mol. doped in supercrit. xenon fluids was studied on the basis of photocond. spectroscopy and X-ray absorption spectroscopy. It was concluded that values of ionization potential derived from photocond. measurement were sensitive for the assocn. of xenon atoms onto the benzene rings of anthracene mol. Results from the X-ray absorption near-edge structures

(XANES) spectra of bromonaphthalene in supercrit. xenon, local assocn. of xenon atoms surrounding Br atom were detected with high sensitivity.
REFERENCE COUNT: 5

L7 ANSWER 20 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1999:707245 CAPLUS
DOCUMENT NUMBER: 132:36951
TITLE: Sample purification for spectroscopic high-pressure investigations by dynamic supercritical fluid extraction
AUTHOR(S): Wagner, Bjorn; Nishioka, Mamoru; Tuma, Dirk; Maiwald, Michael; Schneider, Gerhard M.
CORPORATE SOURCE: Physikalische Chemie, Fakultat fur Chemie, Ruhr-Universitat Bochum, Bochum, D-44780, Germany
SOURCE: Journal of Supercritical Fluids (1999), 16(2), 157-165
CODEN: JSFLEH; ISSN: 0896-8446
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A method for the high resoln. purifn. of 1,4-bis(n-alkylamino)-9,10- anthraquinone dye samples based on a modified supercrit. fluid chromatog. equipment was developed to minimize errors in high-pressure soly. measurements. Impurities and byproducts were eluted in a continuous CO2 flow and the purifn. process could be obsd. by a diode array spectrophotometer. The fact that both static and dynamic soly. expts. of a selected dye gave consistent results turned out to be a credit point for this new method, which can be universally used for other purifications, too. The necessity of calibrating directly in the solvent gas is demonstrated, since some org. solvents lead to characteristic spectral effects which can strongly disagree with those in CO2. Our expts. showed a weakening of these effects towards longer alkyl chains of this substance class. In a sep. section, some remarks are given concerning the use of wavenumbers instead of wavelengths in such expts.
REFERENCE COUNT: 20

L7 ANSWER 21 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1999:486745 CAPLUS
DOCUMENT NUMBER: 131:124630
TITLE: Potential interferences generated during mercury species determination using acid leaching, aqueous ethylation, cryogenic gas chromatography and atomic spectrometry detection techniques
AUTHOR(S): Tseng, C. M.; De Diego, A.; Wasserman, J. C.; Amouroux, D.; Donard, O. F. X.
CORPORATE SOURCE: Laboratoire de Chimie Bio-Inorganique et Environnement - EP CNRS 132, Universite de Pau et des Pays de l'Adour, Pau, 64000, Fr.
SOURCE: Chemosphere (1999), 39(7), 1119-1136
CODEN: CMSHAF; ISSN: 0045-6535
PUBLISHER: Elsevier Science Ltd.

DOCUMENT TYPE: Journal
LANGUAGE: English
AB A careful search for formation of methylmercury (MeHg+) as an artifact and for potential interferences has been carried out using an anal. procedure involving aq. phase ethylation, cryogenic trapping, low temp. gas chromatog. and quartz furnace at. absorption spectrometry (Eth-CT-GC-QFAAS) for mercury speciation, after open-focused microwave extn. The results show that spurious MeHg+ formation from Hg2+ can occur mainly in the chromatog. column during the detn. step rather than during the extn. step. The agent, dimethyldisilazane, acting as a Me donor, appears to be responsible for the EtMeHg formation when high concns. of Hg2+ (>1 ppm) are present in the soln. during the anal. On the other hand, the prodn. of several unknown peaks, closely corresponding to Me2Hg, Et2Hg etc. in the chromatogram, is the result of impurities in the derivatizing agent, NaBEt4. The magnitude of these interferences varies with different lots of reagent. The derivatization and detn. steps must always be checked following std. QA/QC procedures. Once interference problems are taken into account, reliable understanding of Hg cycling and behavior in aquatic environments will be achieved.
REFERENCE COUNT: 14

L7 ANSWER 25 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1999:190364 CAPLUS
DOCUMENT NUMBER: 130:288469
TITLE: "Illuminating single molecules in condensed matter"
AUTHOR(S): *Moerner, W. E.; Orrit, Michel*
CORPORATE SOURCE: Department of Chemistry, Stanford University, Stanford, CA, 94305-5080, USA
SOURCE: **Science (Washington, D. C.) (1999), 283(5408), 1670-1676**
CODEN: SCIEAS; ISSN: 0036-8075
PUBLISHER: American Association for the Advancement of Science
DOCUMENT TYPE: Journal; General Review
LANGUAGE: English
AB A review, with 76 refs. Efficient collection and detection of fluorescence coupled with careful minimization of background from impurities and Raman scattering now enable routine optical microscopy and study of single mols. in complex condensed matter environments. This ultimate method for unraveling ensemble avs. leads to the observation of new effects and to direct measurements of stochastic fluctuations. Expts. at cryogenic temps. open new directions in mol. spectroscopy, quantum optics, and solid-state dynamics. Room-temp. studies apply several techniques (polarization microscopy, single-mol. imaging, emission time dependence, energy transfer, Lifetime studies, and the Like) to a growing array of biophys. problems where new insight may be gained from direct observations of hidden static and dynamic inhomogeneity.
REFERENCE COUNT: 92

L7 ANSWER 28 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1998:529096 CAPLUS
TITLE: Tunneling into magnetic atoms: Local spectroscopy of Kondo impurities.

AUTHOR(S): Crommie, Michael F.; Madhavan, Vidya; Chen, Wei; Jamneala, Tiberiu
CORPORATE SOURCE: Department Physics, Boston University, Boston, MA, 02215, USA
SOURCE: Book of Abstracts, 216th ACS National Meeting, Boston, August 23-27 (1998), INOR-264. American Chemical Society: Washington, D. C.
CODEN: 66KYA2
DOCUMENT TYPE: Conference; Meeting Abstract
LANGUAGE: English
AB The Kondo effect arises from an exchange interaction between the conduction electrons of a host metal and a magnetic impurity, and is predicted to result in local charge and spin variations around the magnetic impurity. We have used a cryogenic scanning tunneling microscope (STM) to perform spectroscopic measurements of the electronic structure of individual Kondo impurities on a gold surface. Cobalt atoms were deposited onto a Au(111) surface at low temp. (4K) to provide a source of isolated magnetic impurities. STM spectroscopy performed on individual cobalt atoms reveals an energetically narrow feature that is identified as the Kondo resonance, the excitation spectrum of a single Kondo impurity. The lineshape of the Kondo resonance is not Lorentzian, but rather has the asym. shape that is characteristic of a Fano resonance. This is explained using a modified Fano theory that includes Coulomb interactions at the site of the impurity. Using at. manipulation, we have also studied interaction effects between two Kondo impurities by monitoring changes in the Kondo resonance as a function of inter- impurity spacing.

L7 ANSWER 30 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1997:642946 CAPLUS
DOCUMENT NUMBER: 127:340796
TITLE: 'ESR spectroscopy of N(4S) atoms trapped in superfluid helium'
AUTHOR(S): *Popov, E. A.; Boltnev, R. E.; Gordon, E. B.; Khmelenko, V. V.; Martynenko, M. V.; Pelmenev, A. A.; Shidov, E. V.*
CORPORATE SOURCE: Institute for Energy Problems of Chemical Physics, Chernogolovka, 142432, Russia
SOURCE: **International Conference on Low Temperature Chemistry, 2nd, Kansas City, Mo., Aug. 4-9, 1996 (1996), 145-146. Editor(s): Durig, James R.; Klabunde, Kenneth J. BkMk Press: Kansas City, Mo.**
CODEN: 65DLAN
DOCUMENT TYPE: Conference
LANGUAGE: English
AB The title spectra , obtained at 1.7 K in nitrogen-helium as well as rare gas-helium slurry (impurity helium solid phase, IHSP), presents a broadened triplet centered at g .apprxeq. 2.0. Anal. of the spectral line shape and width in nitrogen-helium IHSP showed that N(4S) atoms are stabilized in concns. as high as n .apprxeq. 1020/cc; satellites in the ESR indicated the presence of microcryst. nitrogen. ESR of nitrogen atoms in isolated in neon-helium IHSP in concns. n=1015/cc comprised triplets with peak to peak linewidth .DELTA.Hpp = 1.2G. gN =2.0019(8) and hyperfine splitting const . AN = 11.5-11.8 MHz. The results indicate that the nitrogen atoms are surrounded mainly by helium atoms and the spectra obsd. originate from imperfections in IHSP , where the

environment is anisotropic and the nearest neighbor , rare gas or N2 mol., has to be adjacent He atoms.

L7 ANSWER 31 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1997:145837 CAPLUS
DOCUMENT NUMBER: 126:244112
TITLE: "Spectroscopic study of atoms and molecules in liquid helium"
AUTHOR(S): *Takami, M.*
CORPORATE SOURCE: Inorganic Chemical Physics Laboratory, The Institute of Physical and Chemical Research (RIKEN), Saitama, 351-01, Japan
SOURCE: **Comments on Atomic and Molecular Physics (1996), 32(4), 219-231**
CODEN: CAMPBS; ISSN: 0010-2687
PUBLISHER: Gordon & Breach
DOCUMENT TYPE: Journal; General Review
LANGUAGE: English
AB Neutral atoms in liq. He are known to reside in a bubble-like cavity due to a repulsive force with the surrounding He atoms. Phys. properties of such atoms (and mols.) are currently studied by laser spectroscopy , revealing the exotic behavior of impurity particles in superfluid He. The existence of a bubble significantly affects the at. spectra, but in a different way in the low and high excited states of the valance electrons. An optical pumping expt. demonstrates that radiofrequency transitions among Zeeman sublevels have frequencies close to the free space values, while the hyperfine transition obsd. in Cs shows a clear blue-shift ranging from 0.5 to 2% depending on the pressure of the liq. (solid) He. The .sum.-.sum. transitions of metal dimers studied so far show absorption and emission bands close to those in free space. Possible applications are discussed. A review with 40 refs.

L7 ANSWER 32 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1997:79399 CAPLUS
DOCUMENT NUMBER: 126:105442
TITLE: "High-pressure investigations on the solubility of synthetic and natural dyestuffs in supercritical gases by VIS-spectroscopy up to 180 Mpa"
AUTHOR(S): *Schneider, Gerhard M.; Kautz, Cornelia B.; Tuma, Dirk*
CORPORATE SOURCE: Lehrstuhl fur Physikalische Chemie II, Ruhr-Universitat Bochum, Bochum, D-44780, Germany
SOURCE: **Process Technology Proceedings (1996), 12(High Pressure Chemical Engineering), 259-264**
CODEN: PTPREM; ISSN: 0921-8610
PUBLISHER: Elsevier
DOCUMENT TYPE: Journal
LANGUAGE: English
AB In this paper soly. measurements of synthetic and natural dyes are presented using visible spectroscopy. .beta.-Carotene was measured as a function of temp. and pressure in near- and supercrit. CO2 (289-309 K, 10-160 Mpa) and CClF3 (297-326 K, 12-180 MPa) using a static method. Addnl., the solubilities of 1,4-bis(alkylamino)-9,10-anthraquinones (with alkyl = Bu, octyl) were detd. with a dynamic method in temp. and

pressure ranges 310-340 K and 8-20 MPa, resp.; this method permits a continuous purifn. from more sol. impurities as well as the measurement of solubilities at the same time. For both anthraquinone dyes intersection points of the soly. isotherms were found in the plot of concn. vs. pressure. This behavior can be explained by a d. effect.

L7 ANSWER 33 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1997:46457 CAPLUS
DOCUMENT NUMBER: 126:123319
TITLE: Nuclear spin polarization in heavy-ion reactions
AUTHOR(S): Takahashi, Noriaki
CORPORATE SOURCE: Fac. Sci., Osaka Univ., Toyonaka, 560, Japan
SOURCE: Nuclear Reaction Dynamics of Nucleon-Hadron Many Body System: From Nuclear Spins & Mesons in Nuclei to Quark Lepton Nuclear Physics, Proceedings of the RCNP Osaka International Symposium, 14th, Osaka, Dec. 6-9, 1995 (1996), Meeting Date 1995, 54-58. Editor(s): Ejiri, Hiroyasu. World Scientific: Singapore, Singapore.
CODEN: 63UAAR
DOCUMENT TYPE: Conference; General Review
LANGUAGE: English
AB Studies of polarization phenomena in heavy-ion reactions at RCNP will be reviewed. Among other things polarization has been recently found for reaction products 12B from 14N + 9Be at 38 MeV/u. As an example of utilization of polarization for spectroscopic purposes, a novel expt. is introduced; the study of nuclear and condensed-matter physics with use of snowballs, microclusters created around impurity ions is superfluid helium. Nuclear polarization is maintained throughout the lifetime in such impurity ions, 12B, as encapsulated in snowballs. 15 Refs.

L7 ANSWER 34 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1996:698920 CAPLUS
DOCUMENT NUMBER: 126:38962
TITLE: "Optical spectroscopy of atoms in superfluid helium"
AUTHOR(S): *Foerste, M.; Gabrysch, M.; Guenther, H.; Kunze, M.; Layer, K.; Zu Putlitz, G.; Von Stein, U.; Riediger, O.; Tabbert, B.; Zuehlke, C.*
CORPORATE SOURCE: Physikalisches Institut, Universitat Heidelberg, Heidelberg, D-69120, Germany
SOURCE: **Czechoslovak Journal of Physics (1996), 46(Suppl., Pt. S1, Proceedings of the 21st International Conference on Low Temperature Physics, 1996, Part S1), 367-368**
CODEN: CZYPAO; ISSN: 0011-4626
PUBLISHER: Institute of Physics, Academy of Sciences of the Czech Republic
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Optical spectroscopy of impurity atoms and ions immersed into liq. He can contribute to the understanding of the structure of defects in He and their interaction with the superfluid phase as well. Since the theor. understanding of the defect structure in liq. He caused by alkali impurities is incomplete so far, spectroscopic studies of these elements in the liq. He environment are of considerable interest. In this contribution

measurements of the spectra of the heavy alkali elements in superfluid He are presented. The position and the shape of excitation and emission lines of Rb is detd. using a tunable diode laser.

L7 ANSWER 35 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1996:418967 CAPLUS
DOCUMENT NUMBER: 125:96432
TITLE: 'Laser spectroscopy of impurity atoms in superfluid helium'
AUTHOR(S): *Foerste, M.; Guenther, H.; Layer, K.; zu Putlitz, G.; Schumacher, T.; Tabbert, B.*
CORPORATE SOURCE: Physikalisches Institut, Universitat Heidelberg, Heidelberg, D-69120, Germany
SOURCE: **Laser Spectroscopy, International Conference, 12th, Capri, Italy, June 11-16, 1995 (1996), Meeting Date 1995, 386-387. Editor(s): Inguscio, Massimo; Allegrini, Maria; Sasso, Antonio. World Scientific: Singapore, Singapore.**
CODEN: 63AIAJ
DOCUMENT TYPE: Conference
LANGUAGE: English
AB The emission and absorption spectra of foreign atoms implanted into superfluid helium have been recorded. By detg. the line shifts and line broadenings compared to the free atom case, the influence of the surrounding liq. environment on the impurity particles is investigated. Recent spectroscopic results for magnesium and calcium are reported. The lowest triplet p-states of these elements turn out to be strongly affected by the helium matrix, since the absorption lines in the triplet system are much more shifted than transitions in the singlet system. Measurements of the lifetime of the 3s3p3Pj-states of magnesium confirm this observation, showing an unusual long decay const. for the intercombination transition to the 1S0 ground state compared to the Mg atom in vacuum.

L7 ANSWER 37 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1995:871309 CAPLUS
DOCUMENT NUMBER: 124:18873
TITLE: 'Interaction between charge carriers and foreign atoms in superfluid helium. From bound states to unusual transport'
AUTHOR(S): *Bashkin, Eugene P.*
CORPORATE SOURCE: Fachbereich Physik, Philipps-Univ. Marburg, Marburg, D-35032, Germany
SOURCE: **Zeitschrift fuer Physik B: Condensed Matter (1995), 98(3), 439-41**
CODEN: ZPCMDN; ISSN: 0722-3277
PUBLISHER: Springer
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A small amt. of impurities drastically affected the properties of charge carriers in superfluid 4He. Under certain conditions the effective interaction between the carrier and foreign atom turns out to be attractive at large distances. This may result in a localization of the impurity on the elec. charge in superfluid 4He. The attraction causes a significant increase in the concn. of foreign atoms near the carrier (the impurity cloud) and produces

around the charge a macroscopic region of radius 50-70 .ANG. rich with the impurity component. 2D bound states of an electron or ion near the free surface of liq. 4He and a 3He surface impurity were considered. This effect can strongly influence the motion of the charge carriers in xy-plane, which can be studied in expts. on the mobility. Photoelec. absorption of radiation due to the decay of the bound state as well as tunnelling ionization in a static elec. field are discussed. An extra scattering channel due to the interaction between an impurity and the hydrodynamic back-flow around the moving snowball or bubble is described. Within the velocity range of 1-60ms/s this scattering process becomes predominant and dets. the mobility of charged particles in superfluid 4He.

L7 ANSWER 38 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1995:694265 CAPLUS
DOCUMENT NUMBER: 123:305675
TITLE: SFC/NMR online coupling
AUTHOR(S): Albert, Klaus; Braumann, Ulrich
CORPORATE SOURCE: INSTITUT FUR ORGANISCHE CHEMIE, Tuebingen, D-72076, Germany
SOURCE: Special Publication - Royal Society of Chemistry (1995), 163(Frontiers in Analytical Spectroscopy), 86-93
CODEN: SROCDO; ISSN: 0260-6291
PUBLISHER: Royal Society of Chemistry
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The direct coupling of supercrit. fluid chromatog. and 1H NMR spectroscopy is feasible. The advantage of NMR detection in the supercrit. state is the absence of 1H NMR signals of solvents and impurities, the drawbacks of this hyphenated technique are the pressure dependence of NMR signals and the increased spin lattice relaxation times. Despite these problems the spectral quality obtained together with the capability to acquire 2-dimensional NMR spectra may bring SFC-NMR-coupling to an established hyphenated technique. Also the enormous application power of supercrit. fluid extn. in combination with 1H NMR detection will lead to new structural elucidation pathways in the search for new, natural occurring compds. which may be used in medical therapy.

L7 ANSWER 39 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1994:608444 CAPLUS
DOCUMENT NUMBER: 121:208444
TITLE: A new process for the production of high purity carbon monoxide and hydrogen
AUTHOR(S): Kumar, R.; Kratz, W. C.; Guro, D. E.; Golden, T. C.
CORPORATE SOURCE: Air Products and Chemicals, Inc., Allentown, PA, 18195-1501, USA
SOURCE: Process Technology Proceedings (1994), 11(SEPARATION TECHNOLOGY), 383-402
CODEN: PTPREM; ISSN: 0921-8610
DOCUMENT TYPE: Journal

LANGUAGE: English
AB An all-adsorption process for the sepn. and purifn. of both H and CO from steam CH4 reformer (SMR) off-gas was developed. This process uses a new adsorbent which selectively adsorbs CO over all the other impurities including CO2 from a typical SMR off-gas. The process employs two trains of four columns each: the first train produces high-purity CO at ambient pressure and the second train produces high-purity H at feed pressure. This process called GEMINI HYCO VSA was tested using a proprietary adsorbent. A comparison of performance, investment cost, utility requirements, and product CO cost relative to the current cryogenic technol. shows that the required capital investment is 32% lower for the integrated adsorption-SMR case than for the absorption-cryogenic technol.

L7 ANSWER 40 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1994:564194 CAPLUS
DOCUMENT NUMBER: 121:164194
TITLE: "Investigation of impurities in superfluid helium by optical spectroscopy"
AUTHOR(S): *Tabbert, Bernd; Beau, Michael R.; Fischer, Jorg; zu Putlitz, Gisbert; Schreck, Holger*
CORPORATE SOURCE: Phys. Inst., Univ. Heidelberg, Heidelberg, W-6900, Germany
SOURCE: **Physica B: Condensed Matter (Amsterdam, Netherlands) (1994), 194-196, 731-2**
CODEN: PHYBE3; ISSN: 0921-4526
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The implantation of impurity ions in liq. 4Helium leads to the formation of pointlike defects in the quantum fluid. Optical spectroscopy contributes to the understanding of the structure of these defects and of the interaction with the superfluid phase as well. Recent exptl. work was concd. on the spectra of alk. earth ions which show radiative transitions in contrast to the alkali elements investigated in earlier expts.

L7 ANSWER 43 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1994:224018 CAPLUS
DOCUMENT NUMBER: 120:224018
TITLE: Determination of trace amounts of impurities in molybdenum by spark source and glow discharge mass spectrometry
AUTHOR(S): Saito, Morimasa
CORPORATE SOURCE: Natl. Res. Inst. Met., Tokyo, Japan
SOURCE: Nippon Kinzoku Gakkaishi (1994), 58(2), 188-93
CODEN: NIKGAV; ISSN: 0021-4876
DOCUMENT TYPE: Journal
LANGUAGE: Japanese
AB For the detn. of trace and ultra-trace amts. of impurities in high-purity molybdenum, spark source mass spectrometry and glow discharge mass spectrometry were studied. In spark source mass spectrometry using the metal probe method, the liq.-helium cryogenic pump was used to protect the surface of the samples from oxidn. The theor. relative sensitivity factors (Mo = 1) calcd. from phys. properties were used. The anal. results

obtained for molybdenum tablet and high-purity molybdenum were in good agreement with those obtained by other methods (at. absorption spectrometry and others). In glow discharge mass spectrometry, the relative sensitivity factors were calcd. by using the results obtained by spark source mass spectrometry and at. absorption spectrometry, and this method was applied to the detn. of ultra-trace amts. in ultra high-purity molybdenum and gave the satisfactory results. The detection limits (2.sigma., n = 10) in the integration time of 600 s for U and Th were 0.6 ppb and 0.3 ppb, and the values for Al, Si, Cr, Mn and Cu were in the range of 10 ppb to 0.5 ppb.

L7 ANSWER 44 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1994:181896 CAPLUS
DOCUMENT NUMBER: 120:181896
TITLE: 'IR spectroscopy and analysis of the impurity composition of individual xenon fluorides in liquid noble gas solutions'
AUTHOR(S): *Nabiev, Sh. Sh.; Khodzhiev, B. S.*
CORPORATE SOURCE: Kurchatov. Inst., Moscow, Russia
SOURCE: **Vysokochistye Veshchestva (1993), (5), 111-20**
CODEN: VYVEEC; ISSN: 0235-0122
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB The IR spectra of XeFn (n = 2, 4, 6) mols. liquefied xenon and krypton solns. were studied. The frequencies, half-width and intensities of XeFn vibrational bands as well as some anharmonicity consts. of these mols. were detd. With increasing XeF6 concn. in the liq. krypton (.gtoreq.1.5 .times. 10-4 mol/L) and xenon (.gtoreq.4 .times. 10-4 mol/L) solns. (XeF6)m polymers are produced. Polymn. of XeF6 in the liquefied xenon and krypton solns. is accompanied by increase in the structural rigidity of xenon hexafluoride mols. IR spectroscopy of cryogenic solns. can be used for detn. of XeFn impurities in individual xenon fluorides.

L7 ANSWER 45 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1994:21229 CAPLUS
DOCUMENT NUMBER: 120:21229
TITLE: Semi-self-maintained glow discharge in a mixture carbon monoxide and nitrogen at cryogenic temperatures
AUTHOR(S): Azharonok, V. V.; Gurashvili, V. A.; Kiz'min, V. N.; Turkin, N. G.; Filatova, I. I.; Chubrik, N. L.; Shimanovich, V. D.
CORPORATE SOURCE: Inst. Mol. At. Kiz., Belarus
SOURCE: Fizika Plazmy (Moscow, Russian Federation) (1993), 19(7), 903-9
CODEN: FIPLDK; ISSN: 0134-5052
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB Emission spectroscopy was used to study non-self-maintained fast TEA discharge in a CO-N2 cryogenic mixt. The gas temps. were detd. from N2 and N2+ spectra. The relaxation is discussed in terms of mol. collision reactions. The effective electron-ion recombination coeff. is detd. along with the capture of electrons by electroneg. mol. impurities at gas temps. of 120 K.

L7 ANSWER 46 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1993:685220 CAPLUS
DOCUMENT NUMBER: 119:285220
TITLE: Consideration of the chemical reactivity of trace impurities present in a glow discharge
AUTHOR(S): Ohorodnik, S. K.; DeGendt, S.; Tong, S. L.; Harrison, Willard W.
CORPORATE SOURCE: Dep. Chem., Univ. Florida, Gainesville, FL, 32611, USA
SOURCE: Journal of Analytical Atomic Spectrometry (1993), 8(6), 859-65
CODEN: JASPE2; ISSN: 0267-9477
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Optical and mass spectrometric diagnostics were applied in a study of the chem. reactivity of the plasma impurity species in an r.f. glow discharge source. Copper, Fe and Ta metals and Ta powder-based compacted disks were chosen as test cathodes. A cryogenic coil incorporated within the discharge source was used in the investigations of the potential interactions. Significant increases were obsd. in the sputtering gas and cathode matrix ion signals, as well as the ground- and excited-state populations of these species with cryogenic cooling. The relative reactivities of the matrix-element species with water-related species in the plasma and the significance for glow discharge-based anal. techniques are discussed.

L7 ANSWER 47 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1993:634335 CAPLUS
DOCUMENT NUMBER: 119:234335
TITLE: "Spectroscopy of alkali atoms and molecules in superfluid helium"
AUTHOR(S): *Takahashi, Y.; Sano, K.; Kinoshita, T.; Yabuzaki, T.*
CORPORATE SOURCE: Fac. Sci., Kyoto Univ., Kyoto, 606-01, Japan
SOURCE: **Physical Review Letters (1993), 71(7), 1035-8**
CODEN: PRLTAO; ISSN: 0031-9007
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The authors report on the first laser spectroscopy of alkali atoms (Cs and Rb) and mols. (Na2 and Li2) in superfluid helium. General features of the obsd. spectra can be explained in terms of the spherical at. bubble model. The excitation and emission spectra for the D2 lines, however, have double peaked profiles, indicating the importance of the nonspherical d. distribution of surrounding helium atoms. The emission spectra for the mols. show well-resolved vibrational structures in the electronic ground states.

L7 ANSWER 48 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1993:569463 CAPLUS
DOCUMENT NUMBER: 119:169463
TITLE: "Vibrational spectra of phosphine of various degrees of purity in a solution of liquid argon"
AUTHOR(S): *Kondaurov, V. A.; Melikova, S. M.; Nabiev, Sh. Sh.; Sennikov, P. G.; Raldugin, D. A.; Shchepkin, D. N.*

CORPORATE SOURCE: Ross. Nauchn. Tsentr "Kurchatovskii Inst.", Moscow, Russia
SOURCE: **Vysokochistye Veshchestva (1993), (3), 119-26**
CODEN: VYVEEC; ISSN: 0235-0122
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB The method of cryogenic IR spectroscopy was used to study solns. in liq. Ar of phosphine samples with different degrees of purity. The change in the length of the optical path from 1 to 200 cm allowed one to study the overtones and fundamental bands to 3rd order, inclusively. In the IR spectra of samples of the initial phosphine, bands belonging to impurities of hydrocarbons, N2O, CO2 and moisture were recorded.

L7 ANSWER 49 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1993:530487 CAPLUS
DOCUMENT NUMBER: 119:130487
TITLE: Cryogenic coil for glow discharge sources
AUTHOR(S): Ohorodnik, Susan K.; Harrison, Willard W.
CORPORATE SOURCE: Dep. Chem., Univ. Florida, Gainesville, FL, 32611, USA
SOURCE: Analytical Chemistry (1993), 65(18), 2542-4
CODEN: ANCHAM; ISSN: 0003-2700
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A method for removing water vapor and other gaseous impurities from the glow discharge source by phys. freezing out the impurities by means of a cryogenic cooling coil is described. The effectiveness of the cooling is demonstrated with an aluminum alloy sample using glow discharge mass spectrometry. Upon cooling, the interferences from water and other impurities occurring in the m/z range between 10 to 40, which can obscure the Al+ and Mg+ analyte ion signals, are no longer detected. The simplicity and adaptability of the cryogenic cooling coil are also discussed.

L7 ANSWER 51 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1992:563026 CAPLUS
DOCUMENT NUMBER: 117:163026
TITLE: "Monitoring of dopant and impurity concentrations in liquid argon by infrared spectroscopy"
AUTHOR(S): *Moulson, M.; Fabjan, C. W.; Lacarrere, D.; Seidl, W.; Vuillemin, V.*
CORPORATE SOURCE: CERN, Geneva, Switz.
SOURCE: **Nuclear Instruments & Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors, and Associated Equipment (1992), A320(1-2), 277-82**
CODEN: NIMAER; ISSN: 0168-9002
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The authors discuss applications and advantages of liq. phase IR spectroscopy as a technique for monitoring dopant and impurity concns. in liq. argon. The use of IR spectroscopy to detect contaminants in liq. argon is demonstrated. Gas and liq. phase spectra of ethylene and allene in argon are presented and compared. Absorption coeffs.

have been obtained for the principal peaks. The technique may be used to analyze a wide range of substances in cryogenic soln.

L7 ANSWER 52 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1992:499726 CAPLUS
DOCUMENT NUMBER: 117:99726
TITLE: Dye laser spectroscopy of isolated atoms and ions in liquid helium
AUTHOR(S): Zu Putlitz, G.; Beau, M. R.
CORPORATE SOURCE: Phys. Inst., Univ. Heidelberg, Heidelberg, W-6900/1, Germany
SOURCE: Topics in Applied Physics (1992), 70(Dye Lasers: 25 Years), 237-47
CODEN: TAPHD4; ISSN: 0303-4216
DOCUMENT TYPE: Journal; General Review
LANGUAGE: English
AB A review with 33 refs. Alk. earth atoms and ions in superfluid helium were investigated by means of dye laser spectroscopy. The obsd. line shifts and broadenings provide microscopic insight into the structure of such point defects. The results are compared with the data of low pressure shifts in gaseous helium extrapolated to liq. helium d., with reveals new effects due to the liq. environment. Moreover these impurities can be used as new tools for the investigation of the superfluid itself, for instance coloring of vortices or trapping in elec. and magnetic traps. These studies were only made possible by the unique properties of the dye laser, such as high spectral power d., wide range tunability and unsurpassed beam quality.

L7 ANSWER 53 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1992:461850 CAPLUS
DOCUMENT NUMBER: 117:61850
TITLE: Isotopic spectral analysis of inorganic gases
AUTHOR(S): Funtov, V. N.;Nemets, A. M.;Nemets, V. M.; Petrov, A. A.;Solovev, A. A.
CORPORATE SOURCE: Inst. Phys., St. Petersburg Univ., St. Petersburg, 198904, Russia
SOURCE: Analyst (Cambridge, United Kingdom) (1992), 117(6), 1049-54
CODEN: ANALAO; ISSN: 0003-2654
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The possibilities for isotopic spectral gas anal. are considered. The method is based on a combination of an isotope diln. method (with or without further physico-chem. transformation of the resulting anal. mixt.) and a spectroscopic measurement of the isotope compn. of the element to be detd. The transformation includes various processes of isotope balancing, their accumulation and isolation. Detection limits for instrumental techniques are 100 ppb-10 ppt and for the combined techniques 1 ppb-1 ppm. Calibration of the method does not require ref. gas samples based on the compn. of the analyzed gas.

L7 ANSWER 54 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1992:268235 CAPLUS
DOCUMENT NUMBER: 116:268235

TITLE: "Application of a cryospectroscopy method to study the molecular composition of gases"
AUTHOR(S): *Zhigula, L. A.; Kolomiitsova, T. D.; Kondaurov, V. A.; Melikova, S. M.; Shchepkin, D. N.*
CORPORATE SOURCE: Santkt-Peterburg Gos. Univ., St. Petersburg, USSR
SOURCE: **Zhurnal Prikladnoi Spektroskopii (1992), 56(3), 381-8**
CODEN: ZPSBAX; ISSN: 0514-7506
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB A cryogenic procedure was developed for the sensitive detn. of mol. microimpurities in pure and ultrapure gases. IR absorption spectra of liq. air, oxygen as well as of solns. of 20 different substances (hydrocarbons, freons etc.) in liq. argon were investigated. When using optical layers up to 2 m, the sensitivity of the procedure amts. to 10-8-10-4 mol.% from the ground substance. Calibration tables for 27 characteristic impurities are presented.

L7 ANSWER 62 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1989:104145 CAPLUS
DOCUMENT NUMBER: 110:104145
TITLE: "Vibrational spectra of liquid high-purity silicon, germanium, sulfur, and selenium hydrides and their solutions in liquid krypton"
AUTHOR(S): *Devyatykh, G. G.; Sennikov, P. G.; Tokhadze, K. G.; Shkrunin, V. E.*
CORPORATE SOURCE: Inst. Khim., Gorkiy, USSR
SOURCE: **Vysokochistye Veshchestva (1988), (6), 21-8**
CODEN: VYVEEC; ISSN: 0235-0122
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB The cryogenic IR absorption spectra were studied of liq. hydrides of Group IVA elements and Group VIA elements and their solns. (SiH4, GeH4, H2S, H2Se) in liq. Kr, while the principal attention was given to a study of the spectra in the little studied region of overtones and composite bands. These studies can serve as a basis for further study of associative equil. in pure liqs., phase equil., and the state of impurities in systems based on them.

L7 ANSWER 66 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1987:428495 CAPLUS
DOCUMENT NUMBER: 107:28495
TITLE: The kinetics of phonon-impurity system of superfluid helium-3-helium-4 solutions
AUTHOR(S): Adamenko, I. N.; Rudavskii, E. Ya.
CORPORATE SOURCE: Khar'k. Gos. Univ., Kharkov, USSR
SOURCE: Fizika Nizkikh Temperatur (Kiev) (1987), 13(1), 3-32
CODEN: FNTEDK; ISSN: 0132-6414
DOCUMENT TYPE: Journal; General Review
LANGUAGE: Russian

AB A review with 81 refs. on exptl. and theor. studies on elementary excitations and their interactions; transport properties (viscosity, diffusion, thermal cond.); and absorption and velocity of 1st and 2nd sound in superfluid 3He-4He solns.

L7 ANSWER 67 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1987:110911 CAPLUS
DOCUMENT NUMBER: 106:110911
TITLE: Helium-filled proportional counter for low-temperature operation (4.2-300 K) and its application to cryogenic resonance-electron Moessbauer spectroscopy
AUTHOR(S): Isozumi, Yasuhito; Kishimoto, Shunji; Katano, Rintaro; Takekoshi, Hidekuni
CORPORATE SOURCE: Radioisot. Res. Cent., Kyoto Univ., Kyoto, Japan
SOURCE: Review of Scientific Instruments (1987), 58(2), 293-8
CODEN: RSINAK; ISSN: 0034-6748
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The operation of a proportional counter filled with He gas was investigated at low temps. down to 5 K. A He-filled counter cooled at temps. below 30 K works well in the proportional region, but with low gas gains (.ltoreq.100). The operation at low temps. (.ltoreq.30 K) is attributed to the complete removal of impurities from He gas as well as the extreme depression of the reaction frequency of metastable He. The absence of impurities results in eliminating the Penning effect, i.e., an ionization process of impurity atoms or mols. by collisions with metastable He, which spreads electron avalanches in both space and time if He gas contains a slight amt. of impurities (1-103 ppm). Continuous discharges caused by the photoeffect of UV photons, which are mostly produced in decay channels of metastable He are thermally quenched at low temps. below 30 K. The He-filled counter provides a new method to detect nuclear radiations at very low temps. The present counter technique has been successfully applied to the resonance-electron Moessbauer spectroscopy near liq.-He temp. (.apprx.5 K).

L7 ANSWER 68 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1986:468672 CAPLUS
DOCUMENT NUMBER: 105:68672
TITLE: Transport efficiency of free atoms for laser spectroscopy using a cryogenic helium jet
AUTHOR(S): Martin, A. G.; Dutta, S. B.; Rogers, W. F.; Clark, D. L.
CORPORATE SOURCE: Nucl. Struct. Res. Lab., Univ. Rochester, Rochester, NY, 14627, USA
SOURCE: Nuclear Instruments & Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors, and Associated Equipment (1986), A247(3), 520-4
CODEN: NIMAER; ISSN: 0168-9002
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A cryogenic He jet system using pure He was developed to thermalize and transport nuclear reaction products to a laser spectroscopy chamber for isotope shift and hyperfine

structure measurements. The transport properties of the He jet were studied by using 126Ba(T1/2 = 100 min) produced by an 80-MeV 12C beam impinging on natural Sn targets. High transport efficiency (20-40%) of the reaction products in ultrapure He was achieved, but was sensitive to minute amts. of impurities. It has not been possible to transport Ba in elemental form, making laser spectroscopic measurements on free atoms impossible. An explanation to the problem is suggested.

L7 ANSWER 69 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1986:116675 CAPLUS
DOCUMENT NUMBER: 104:116675
TITLE: Application of low temperature desorption in systems for adsorptive purification of cryogenic gases
AUTHOR(S): Leyarovski, E.; Georgiev, Ya.; Zakhariev, A.
CORPORATE SOURCE: Dep. Magn. Low Temp., G. Nadzhakov Inst. Solid State Phys., Sofia, 1184, Bulg.
SOURCE: Cryogenics (1986), 26(1), 29-32
CODEN: CRYOAX; ISSN: 0011-2275
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The application of low-temp. desorption and reactivation of the adsorbent in adsorptive systems for the purifn. of cryogenic gases from gas impurities is considered. The degree of purifn. obtained by using low-temp. desorption is evaluated. Expts. for the detn. of the rate and the degree of desorption of N and H on charcoal at 77.4 K were carried out. Practical schemes for purifn. of gases by using low-temp. desorption of the main part of the adsorbed substances are proposed.

L7 ANSWER 70 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1985:226179 CAPLUS
DOCUMENT NUMBER: 102:226179
TITLE: Phonon and impurity absorption of sound in dilute helium-3/helium-4 solutions below 0.5 K
AUTHOR(S): Chagovets, V. K.; Rudavskii, E. Ya.; Goncharov, V. A.
CORPORATE SOURCE: Fiz.-Tekh. Inst. Nizk. Temp., Kharkov, USSR
SOURCE: Fizika Nizkikh Temperatur (Kiev) (1985), 11(3), 266-71
CODEN: FNTEDK; ISSN: 0132-6414
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB The sound absorption, .alpha., and dissipative processes in 4He and 3He-4He dil. soln. contg. 1.5 .times. 10-3 3He were studied at 40-400 mK and 30-50 MHz by a coherent pulse technique. For 4He, the temp. dependence of .alpha. is well described by a 3-phonon process, while for the dil. soln. by both a viscous relaxation and a new phonon- impurity relaxation process. The dil. soln. retains the anomalous phonon dispersion as that in 4He.

L7 ANSWER 71 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1984:594496 CAPLUS

DOCUMENT NUMBER: 101:194496
TITLE: Adsorption methods for the purification of air and the products of air fractionation
AUTHOR(S): Vagin, E. V.; Petukhov, S. S.
CORPORATE SOURCE: USSR
SOURCE: Khimicheskoe i Neftyanoe Mashinostroenie (1984), (7), 18-20
CODEN: KHNMAO; ISSN: 0023-1126
DOCUMENT TYPE: Journal; General Review
LANGUAGE: Russian
AB A review, with 9 refs., is given on the use of adsorption and combined condensation-adsorption methods for the removal of oil vapors, CO2, H2O, and other impurities from air and cryogenic air fractionation products.

L7 ANSWER 73 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1983:62523 CAPLUS
DOCUMENT NUMBER: 98:62523
TITLE: Spectroscopic studies of pyrazine in cryogenic solutions
AUTHOR(S): Lee, J.; Li, F.; Bernstein, E. R.
CORPORATE SOURCE: Dep. Chem., Colorado State Univ., Fort Collins, CO, 80523, USA
SOURCE: Journal of Physical Chemistry (1983), 87(2), 260-5
CODEN: JPCHAX; ISSN: 0022-3654
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The 1st excited singlet (1B3u) and triplet (3B3u) states of pyrazine are studied in the cryogenic liqs. CH4, C2H6, C3H8, C4H10, C2H4, C3H6, and 1-C4H8. The reported data include 1B3u .tautm.1A1g absorption, fluorescence, and lifetimes and 3B3u .fwdarw. 1A1g phosphorescence and lifetimes as a function of temp. and concn. From the behavior of the 1B3u .tautm. 1A1g system H bonding is an important feature of the intramol. potential in these solns. The lifetime of the singlet state is quite short with an upper limit of .apprx.5 ns. The 3B3u .fwdarw. 1A1g phosphorescence has a measured 4-ms lifetime at 90 K which is consistent with an impurity quenching mechanism and impurity concn. of 0.01 ppm. It was possible to sep. out radiative, nonradiative, and impurity quenching rate consts. in these systems for the 3B3u state of pyrazine. An activation energy for the temp.-dependent radiationless process of .apprx.2 kcal/mol is regarded as the H-bonding energy between solvent and pyrazine (N..HC) in the excited 3B3u state.

L7 ANSWER 74 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1983:25039 CAPLUS
DOCUMENT NUMBER: 98:25039
TITLE: Spectroscopic studies of pyrazine in cryogenic solutions
AUTHOR(S): Lee, J.; Li, F.; Bernstein, E. R.
CORPORATE SOURCE: Dep. Chem., Colorado State Univ., Fort Collins, CO, USA
SOURCE: Report (1982), TR-7; Order No. AD-A116780, 37 pp. Avail.: NTIS From: Gov. Rep. Announce. Index (U. S.) 1982, 82(23), 4841

DOCUMENT TYPE: Report
LANGUAGE: English
AB The differences between the n.pi. transition of pyrazine and the π- π transition of naphthalene and benzene used as probes for the structure and dynamics of cryogenic solns. are discussed in terms of H bonding (-N...H-C). Four main points can be made based on the above spectroscopic studies. First, the addn. off H bonding to the pyrazine/solvent interaction causes changes of the intermol. potential as a function off temp. Thus, the fluorescence spectra are shifted to higher energy as temp. increases. Secondly, H bonding in the excited state tends to reduce the nonradiative processes and results in an activation energy for radiationless decay of roughly 2 kcal/mol for the 3B3u state. Thirdly, solvent effects on the ground state and the 3B3u state are quite similar. Fourthly, in these cryogenic solvents the triplet state lifetime is greatly influenced by an impurity quenching process. It was possible to sep. this rate from the intramol. radiative and nonradiative rates and to arrive at an impurity concn. est. of 0.01 ppm in C2H6. The lifetime measured for the phosphorescence under these conditions is 4 ms which is within a factor of 4 of the longest lifetime measured for this system in a rigid glass.

L7 ANSWER 75 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1982:132936 CAPLUS
DOCUMENT NUMBER: 96:132936
TITLE: "Cryogenic techniques in infrared spectroscopy"
AUTHOR(S): *Kartha, S. B.; Kartha, V. B.; Soni, J. N.*
CORPORATE SOURCE: Bhabha At. Res. Cent., Bombay, 400 085, India
SOURCE: **Proc. Symp. Infrared Technol. Instrum. (1981), Meeting Date 1980, 429-35. India Dep. Atomic Energy: Bombay, India.**
CODEN: 47HTAP
DOCUMENT TYPE: Conference
LANGUAGE: English
AB Two low-temp. IR cells, one for low-temp. solid state studies and the other for low-temp. liq. phase studies were fabricated for studying IR spectra of cryogenic systems. The app. can be used to study conformational inversion, isotopic anal., and impurities in high-purity O2.

	Hits	Search Text
1	1	(cryogenic with (fluorocarbon$3 or (fluorinat$3 near3 hydrocarbon$3))) and impurit$3
2	73	cryogenic with (fluorocarbon$3 or (fluorinat$3 near3 hydrocarbon$3))
3	192	cryogenic with (freon$2 or fluorocarbon$3 or (fluorinat$3 near3 hydrocarbon$3))
4	7	(cryogenic with (freon$2 or fluorocarbon$3 or (fluorinat$3 near3 hydrocarbon$3))) and (impurit$3 or comtaminat$3)
5	260	freon$2 with (impurit$3 or contaminat$4)
6	159	(freon$2 with (impurit$3 or contaminat$4)) and (liquid or cryogen$3)
7	28	(freon$2 with (impurit$3 or contaminat$4)) with (liquid$2 or cryogen$3)
8	9060	(cryogenic or supercritical) and (impurit$3 or contaminat$3)
9	781	((cryogenic or supercritical) and (impurit$3 or contaminat$3)) and (IR or infra-red)
10	71	(((cryogenic or supercritical) and (impurit$3 or contaminat$3)) and (IR or infra-red)) and ((detect$4 or determin$4) with (impuriti$4 or contaminat$4))
11	4326	((250/343,352) or (436/164-167)).CCLS.
12	216	(((250/343,352) or (436/164-167)).CCLS.) and (cryogen$3 or superfluid$3 or supercritical)
13	8	((((250/343,352) or (436/164-167)).CCLS.) and (cryogen$3 or superfluid$3 or supercritical)) and ((detect$4 or determin$4) with (impuriti$4 or contaminat$4))